1

SEQUENCE LISTING

<110>	University of South Florida	
<120> Expres	Polynucleotides for Reducing Respiratory Syncytial Virus Gene sion	
<130>	USF-208TCXC1	
<150> <151>	· ·	
<150> <151>		
<160>	15	
<170>	PatentIn version 3.2	
<210><211><211><212><213>		
<220> <223>	nucleotide sequence of the siRNA for RSV NS1, designated siNS1	
<400> ggcagc	1 aatt cattgagtat gcttctcgaa ataagcatac tcaatgaatt gctgcctttt	60
tg		62
<210><211><212><213>	DNA	
<220> <223>	nucleotide sequence of the siRNA for RSV NS1, designated siNS1a	a
<400> gtgtgc	2 cctg ataacaatat tcaagagata ttgttatcag ggcacacttt tttg	54
<210><211><211><212><213>	DNA	
<220> <223>	nucleotide sequence of the siRNA for HPV18 E7, designated siE7	
<400> gaaaac	3 gatg aaatagatgt tcaagagaca tctatttcat cgttttcttt ttt	53

<211> 63

2

<212> <213>	DNA Artificial Sequence
<220>	
<223>	nucleotide sequence of the siRNA for type A Influenza virus PB2, designated siPB2
<400>	4
	# attc aatatggaaa gaactcgagt tttgttcttt ccatattgaa tatagccttt 60
ttg	63
<210>	5
<211>	56
<212>	DNA
<213>	Artificial Sequence
<220>	
<223>	7
	designated siUR
-100-	E
<400>	5 gatc agaatacttc gctcgagcga agtattctga tcgtgaccct tttttg
ggccac	gate agaataette getegagega agtattetga tegtgaeeet tttttg 56
<210>	6
<211>	20
<212>	DNA
	Artificial Sequence
<220>	
<223>	IFN-beta forward primer
<400>	6
ataagca	aget ccagetecaa 20
<210>	7
<211>	20
<212>	DNA
<213>	Artificial Sequence
<220>	
<223>	IFN-beta reverse primer
<400>	7
ctgtctg	gctg gtggagttca 20
<210>	0
<210> <211>	8
	20
<212>	
<413>	Artificial Sequence
<220>	
<223>	RSV-NS1 forward primer
/	zoznaza primer
<400>	8

atgggg	atggggtgca attcattgag 20				
<210><211><211><212><213>					
<220> <223>	RSV-NS1 reverse primer				
<400> cagggc	9 acac ttcactgct	19			
<210><211><211><212><213>					
1000	RSV-F forward primer				
<400> tgcagt	10 gcag ttagcaaagg	20			
<210><211><212><213>					
<220> <223>	RSV-F reverse primer				
<400> tctggc	11 tcga ttgtttgttg	20			
<210><211><211><212><213>	12 19 DNA Artificial Sequence				
<220> <223>	GAPDH forward primer				
<400>	12 attg acctcaact	19			
<210><211><211><212><213>	13 17 DNA Artificial Sequence				
<220> <223>	GAPDH reverse primer				

<400> 13 gacgccagtg gactcca 17 <210> 14 <211> 15222 <212> DNA <213> Human respiratory syncytial virus <400> 14 acgcgaaaaa atgcgtacaa caaacttgca taaaccaaaa aaatggggca aataagaatt 60 tgataagtac cacttaaatt taactccctt ggttagagat gggcagcaat tcattgagta 120 tgataaaagt tagattacaa aatttgtttg acaatgatga agtagcattg ttaaaaataa 180 catgctatac tgataaatta atacatttaa ctaacgcttt ggctaaggca gtgatacata 240 caatcaaatt gaatggcatt gtgtttgtgc atgttattac aagtagtgat atttgcccta 300 ataataatat tgtagtaaaa tccaatttca caacaatgcc agtactacaa aatggaggtt 360 atatatggga aatgatggaa ttaacacatt gctctcaacc taatgqtcta ctagatqaca 420 attgtgaaat taaattctcc aaaaaactaa gtgattcaac aatgaccaat tatatgaatc 480 aattatctga attacttgga tttgatctta atccataaat tataattaat atcaactagc 540 aaatcaatgt cactaacacc attagttaat ataaaactta acagaagaca aaaatggggc 600 aaataaatca attcagccaa cccaaccatg gacacaaccc acaatgataa tacaccacaa 660 agactgatga tcacagacat gagaccgttg tcacttgaga ccataataac atcactaacc 720 agagacatca taacacacaa atttatatac ttgataaatc atgaatgcat aqtgaqaaaa 780 840 aaagtaggaa gcactaaata taaaaaatat actgaataca acacaaaata tggcactttc 900 cctatgccaa tattcatcaa tcatgatggg ttcttagaat gcattggcat taagcctaca 960 aagcatactc ccataatata caagtatgat ctcaatccat aaatttcaac acaatattca 1020 cacaatctaa aacaacaact ctatgcataa ctatactcca tagtccagat ggagcctgaa 1080 aattatagta atttaaaatt aaggagagat ataagataga agatggggca aatacaaaga 1140 tggctcttag caaagtcaag ttgaatgata cactcaacaa agatcaactt ctgtcatcca 1200 gcaaatacac catccaacgg agcacaggag atagtattga tactcctaat tatgatgtgc 1260 agaaacacat caataagtta tgtggcatgt tattaatcac agaagatgct aatcataaat 1320 tcactgggtt aataggtatg ttatatgcga tgtctaggtt aggaagagaa gacaccataa 1380 aaatactcag agatgcggga tatcatgtaa aagcaaatgg agtagatgta acaacacatc 1440 gtcaagacat taatggaaaa gaaatgaaat ttgaagtgtt aacattggca agcttaacaa 1500

4

PCT/US2004/040727

ctgaaattca aatcaacatt gagatagaat ctagaaaatc ctacaaaaaa atgctaaaag	1560
aaatgggaga ggtagctcca gaatacaggc atgactctcc tgattgtggg atgataatat	1620
tatgtatagc agcattagta ataactaaat tagcagcagg ggacagatct ggtcttacag	1680
ccgtgattag gagagctaat aatgtcctaa aaaatgaaat gaaacgttac aaaggcttac	1740
tacccaagga catagccaac agcttctatg aagtgtttga aaaacatccc cactttatag	1800
atgtttttgt tcattttggt atagcacaat cttctaccag aggtggcagt agagttgaag	1860
ggatttttgc aggattgttt atgaatgcct atggtgcagg gcaagtgatg ttacggtggg	1920
gagtettage aaaateagtt aaaaatatta tgttaggaca tgetagtgtg caageagaaa	1980
tggaacaagt tgttgaggtt tatgaatatg cccaaaaatt gggtggtgaa gcaggattct	2040
accatatatt gaacaaccca aaagcatcat tattatcttt gactcaattt cctcacttct	2100
ccagtgtagt attaggcaat gctgctggcc taggcataat gggagagtac agaggtacac	2160
cgaggaatca agatctatat gatgcagcaa aggcatatgc tgaacaactc aaagaaaatg	2220
gtgtgattaa ctacagtgta ctagacttga cagcagaaga actagaggct atcaaacatc	2280
agcttaatcc aaaagataat gatgtagagc tttgagttaa taaaaaatgg ggcaaataaa	2340
tcatcatgga aaagtttgct cctgaattcc atggagaaga tgcaaacaac agggctacta	2400
aattootaga atcaataaag ggcaaattoa catcacccaa agatoocaag aaaaaagata	2460
gtatcatatc tgtcaactca atagatatag aagtaaccaa agaaagccct ataacatcaa	2520
attcaactat tatcaaccca acaaatgaga cagatgatac tgcagggaac aagcccaatt	2580
atcaaagaaa acctctagta agtttcaaag aagaccctac accaagtgat aatccctttt	2640
ctaaactata caaagaaacc atagaaacat ttgataacaa tgaagaagaa tccagctatt	2700
catacgaaga aataaatgat cagacaaacg ataatataac agcaagatta gataggattg	2760
atgaaaaatt aagtgaaata ctaggaatgc ttcacacatt agtagtggca agtgcaggac	2820
ctacatctgc tcgggatggt ataagagatg ccatgattgg tttaagagaa gaaatgatag	2880
aaaaaatcag aactgaagca ttaatgacca atgacagatt agaagctatg gcaagactca	2940
ggaatgagga aagtgaaaag atggcaaaag acacatcaga tgaagtgtct ctcaatccaa	3000
catcagagaa attgaacaac ctattggaag ggaatgatag tgacaatgat ctatcacttg	3060
aagatttetg attagttace actetteaca teaacacaca ataccaacag aagaccaaca	3120
aactaaccaa cccaatcatc caaccaaaca tccatccgcc aatcagccaa acagccaaca	3180
aaacaaccag ccaatccaaa actaaccacc cggaaaaaat ctataatata gttacaaaaa	3240

6

aaggaaaggg tggggcaaat atggaaacat acgtgaacaa gcttcacgaa ggctccacat 3300 acacagetge tgttcaatac aatgtettag aaaaagaega tgaceetgea teaettacaa 3360 tatgggtgcc catgttccaa tcatctatgc cagcagattt acttataaaa gaactagcta 3420 atgtcaacat actagtgaaa caaatatcca cacccaaggg accttcacta agagtcatga 3480 taaactcaag aagtgcagtg ctagcacaaa tgcccagcaa atttaccata tgcgctaatg 3540 tgtccttgga tgaaagaagc aaactagcat atgatgtaac cacaccctqt qaaatcaaqq 3600 catgtagtct aacatgccta aaatcaaaaa atatgttgac tacagttaaa gatctcacta 3660 tgaagacact caaccctaca catgatatta ttgctttatg tgaatttgaa aacatagtaa 3720 catcaaaaaa agtcataata ccaacatacc taagatccat cagtgtcaga aataaagatc 3780 tgaacacact tgaaaatata acaaccactg aattcaaaaa tgctatcaca aatgcaaaaa 3840 tcatccetta etcaggatta etattagtea teacagtgae tgacaacaaa ggagcattea 3900 aatacataaa gccacaaagt caattcatag tagatcttgg agcttaccta gaaaaagaaa 3960 gtatatatta tgttaccaca aattggaagc acacagctac acgatttgca atcaaaccca 4020 tggaagatta acctttttcc tctacatcag tgtgttaatt catacaaact ttctacctac 4080 attetteaet teaceateae aateaeaaae aetetgtggt teaaceaate aaacaaaaet 4140 tatctgaagt cccagatcat cccaagtcat tgtttatcag atctagtact caaataagtt 4200 aataaaaaat atacacatgg ggcaaataat cattggagga aatccaacta atcacaatat 4260 ctgttaacat agacaagtcc acacaccata cagaatcaac caatggaaaa tacatccata 4320 acaatagaat teteaageaa attetggeet taetttaeae taataeaeat gateaeaaea 4380 ataatctctt tgctaatcat aatctccatc atgattgcaa tactaaacaa actttgtgaa 4440 tataacgtat tccataacaa aacctttgag ttaccaagag ctcgagtcaa cacatagcat 4500 tcatcaatcc aacagcccaa aacagtaacc ttgcatttaa aaatgaacaa cccctacctc 4560 tttacaacac ctcattaaca tcccaccatg caaaccacta tccatactat aaagtagtta 4620 attaaaaata gtcataacaa tgaactagga tatcaagact aacaataaca ttggggcaaa 4680 tgcaaacatg tccaaaaaca aggaccaacg caccgctaag acattagaaa ggacctggga 4740 cactctcaat catttattat tcatatcatc gtgcttatat aagttaaatc ttaaatctgt 4800 agcacaaatc acattatcca ttctggcaat qataatctca acttcactta taattqcaqc 4860 catcatattc atagcctcgg caaaccacaa agtcacacca acaactgcaa tcatacaaga 4920 tgcaacaagc cagatcaaga acacaacccc aacatacctc acccagaatc ctcaqcttqq 4980 aatcagtccc tctaatccgt ctgaaattac atcacaaatc accaccatac tagcttcaac 5040

aacaccagga	gtcaagtcaa	ccctgcaatc	cacaacagtc	aagaccaaaa	acacaacaac	5100
aactcaaaca	caacccagca	agcccaccac	aaaacaacgc	caaaacaaac	caccaagcaa	5160
acccaataat	gattttcact	ttgaagtgtt	caactttgta	ccctgcagca	tatgcagcaa	5220
caatccaacc	tgctgggcta	tctgcaaaag	aataccaaac	aaaaaaccag	gaaagaaaac	5280
cactaccaag	cccacaaaaa	aaccaaccct	caagacaacc	aaaaaagatc	ccaaacctca	5340
aaccactaaa	tcaaaggaag	tacccaccac	caagcccaca	gaagagccaa	ccatcaacac	5400
caccaaaaca	aacatcataa	ctacactact	cacctccaac	accacaggaa	atccagaact	5460
cacaagtcaa	atggaaacct	tccactcaac	ttcctccgaa	ggcaatccaa	gcccttctca	5520
agtctctaca	acatccgagt	acccatcaca	accttcatct	ccacccaaca	caccacgcca	5580
gtagttactt	aaaaacatat	tatcacaaaa	agccatgacc	aacttaaaca	gaatcaaaat	5640
aaactctggg	gcaaataaca	atggagttgc	taatcctcaa	agcaaatgca	attaccacaa	5700
tcctcactgc	agtcacattt	tgttttgctt	ctggtcaaaa	catcactgaa	gaattttatc	5760
aatcaacatg	cagtgcagtt	agcaaaggct	atcttagtgc	tctgagaact	ggttggtata	5820
ccagtgttat	aactatagaa	ttaagtaata	tcaaggaaaa	taagtgtaat	ggaacagatg	5880
ctaaggtaaa	attgataaaa	caagaattag	ataaatataa	aaatgctgta	acagaattgc	5940
agttgctcat	gcaaagcaca	ccaccaacaa	acaatcgagc	cagaagagaa	ctaccaaggt	6000
ttatgaatta	tacactcaac	aatgccaaaa	aaaccaatgt	aacattaagc	aagaaaagga	6060
aaagaagatt	tcttgttttt	ttgttaggtg	ttggatctgc	aatcgccagt	ggcgttgctg	6120
tatctaaggt	cctgcaccta	gaaggggaag	tgaacaagat	caaaagtgct	ctactatcca	6180
caaacaaggc	tctagtcagc	ttatcaaatg	gagttagtgt	cttaaccagc	aaagtgttag	6240
acctcaaaaa	ctatatagat	aaacaattgt	tacctattgt	gaacaagcaa	agctgcagca	6300
tatcaaatat	agaaactgtg	atagagttcc	aacaaaagaa	caacagacta	ctagagatta	6360
ccagggaatt	tagtgttaat	gcaggtgtaa	ctacacctgt	aagcacttac	atgttaacta	6420
atagtgaatt	attgtcatta	atcaatgata	tgcctataac	aaatgatcag	aaaaagttaa	6480
tgtccaacaa	tgttcaaata	gttagacagc	aaagttactc	tatcatgtcc	ataataaaag	6540
aggaagtctt	agcatatgta	gtacaattac	cactatatgg	tgttatagat	acaccctgtt	6600
ggaaactaca	cacatcccct	ctatgtacaa	ccaacacaaa	agaagggtcc	aacatctgtt	6660
taacaagaac	tgacagagga	tggtactgtg	acaatgcagg	atcagtatct	ttcttcccac	6720
aagctgaaac	atgtaaagtt	caatcaaatc	gagtattttg	tgacacaatg	aacagtttaa	6780

cattaccaag	tgaaataaat	ctctgcaatg	ttgacatatt	caaccccaaa	tatgattgta	6840
aaattatgac	ttcaaaaaca	gatgtaagca	gctccgttat	cacatctcta	ggagccattg	6900
tgtcatgcta	tggcaaaact	aaatgtacag	catccaataa	aaatcgtgga	atcataaaga	6960
cattttctaa	cgggtgcgat	tatgtatcaa	ataaagggat	ggacactgtg	tctgtaggta	7020
acacattata	ttatgtaaat	aagcaagaag	gtaaaagtct	ctatgtaaaa	ggtgaaccaa	7080
taataaattt	ctatgaccca	ttagtattcc	cctctgatga	atttgatgca	tcaatatctc	7140
aagtcaacga	gaagattaac	cagagcctag	catttattcg	taaatccgat	gaattattac	7200
ataatgtaaa	tgctggtaaa	tccaccacaa	atatcatgat	aactactata	attatagtga	7260
ttatagtaat	attgttatca	ttaattgctg	ttggactgct	cttatactgt	aaggccagaa	7320
gcacaccagt	cacactaagc	aaagatcaac	tgagtggtat	aaataatatt	gcatttagta	7380
actaaataaa	aatagcacct	aatcatgttc	ttacaatggt	ttactatctg	ctcatagaca	7440
acccatctgt	cattggattt	tcttaaaatc	tgaacttcat	cgaaactctc	atctataaac	7500
catctcactt	acactattta	agtagattcc	tagtttatag	ttatataaaa	cacaattgaa	7560
tgccagatta	acttaccatc	tgtaaaaatg	aaaactgggg	caaatatgtc	acgaaggaat	7620
ccttgcaaat	ttgaaattcg	aggtcattgc	ttaaatggta	agaggtgtca	ttttagtcat	7680
aattattttg	aatggccacc	ccatgcactg	cttgtaagac	aaaactttat	gttaaacaga	7740
atacttaagt	ctatggataa	aagtatagat	accttatcag	aaataagtgg	agctgcagag	7800
ttggacagaa	cagaagagta	tgctcttggt	gtagttggag	tgctagagag	ttatatagga	7860
tcaataaaca	atataactaa	acaatcagca	tgtgttgcca	tgagcaaact	cctcactgaa	7920
ctcaatagtg	atgatatcaa	aaagctgagg	gacaatgaag	agctaaattc	acccaagata	7980
agagtgtaca	atactgtcat	atcatatatt	gaaagcaaca	ggaaaaacaa	taaacaaact	8040
atccatctgt	taaaaagatt	gccagcagac	gtattgaaga	aaaccatcaa	aaacacattg	8100
gatatccata	agagcataac	catcaacaac	ccaaaagaat	caactgttag	tgatacaaat	8160
gaccatgcca	aaaataatga	tactacctga	caaatatcct	tgtagtataa	cttccatact	8220
aataacaagt	agatgtagag	ttactatgta	taatcaaaag	aacacactat	atttcaatca	8280
aaacaaccca	aataaccata	tgtactcacc	gaatcaaaca	ttcaatgaaa	tccattggac	8340
ctctcaagaa	ttgattgaca	caattcaaat	ttttctacaa	catctaggta	ttattgagga	8400
tatatataca	atatatatat	tagtgtcata	acactcaatt	ctaacactca	ccacatcgtt	8460
acattattaa	ttcaaacaat	tcaagttgtg	ggacaaaatg	gatcccatta	ttaatggaaa	8520
ttctgctaat	gtttatctaa	ccgatagtta	tttaaaaggt	gttatctctt	tctcagagtg	8580

taatgettta ggaagttaca tattcaatgg teettatete aaaaatgatt ataccaaett 8640 aattagtaga caaaatccat taatagaaca catgaatcta aagaaactaa atataacaca 8700 gtccttaata tctaagtatc ataaaggtga aataaaatta gaagaaccta cttattttca 8760 gtcattactt atgacataca agagtatgac ctcgtcagaa cagattgcta ccactaattt 8820 acttaaaaag ataataagaa gagctataga aataagtgat qtcaaagtct atgctatatt 8880 gaataaacta gggcttaaag aaaaggacaa gattaaatcc aacaatggac aagatgaaga 8940 caactcagtt attacgacca taatcaaaga tgatatactt tcagctgtta aagataatca 9000 atctcatctt aaagcagaca aaaatcactc tacaaaacaa aaagacacaa tcaaaacaac 9060 actettgaag aaattgatgt gtteaatgea acateeteea teatggttaa tacattggtt 9120 taacttatac acaaaattaa acaacatatt aacacagtat cgatcaaatg aggtaaaaaa 9180 ccatgggttt acattgatag ataatcaaac tcttagtgga tttcaattta ttttgaacca 9240 atatggttgt atagtttatc ataaggaact caaaagaatt actgtgacaa cctataatca 9300 attettgaca tggaaagata ttageettag tagattaaat qtttqtttaa ttaeatqqat 9360 tagtaactgc ttgaacacat taaataaaag cttaggctta agatgcggat tcaataatgt 9420 tatcttgaca caactattcc tttatggaga ttgtatacta aagctatttc acaatgaggg 9480 gttctacata ataaaagagg tagagggatt tattatgtct ctaattttaa atataacaga 9540 agaagatcaa ttcagaaaac gattttataa tagtatgctc aacaacatca cagatgctgc 9600 taataaagct cagaaaaatc tgctatcaag agtatgtcat acattattag ataagacagt 9660 gtccgataat ataataaatg gcagatggat aattctatta agtaagttcc ttaaattaat 9720 taagettgea ggtgacaata acettaacaa tetgagtgaa etatattttt tgtteagaat 9780 atttggacac ccaatggtag atgaaagaca agccatggat gctgttaaaa ttaattgcaa 9840 tgagaccaaa ttttacttgt taagcagtct gagtatgtta agaggtgcct ttatatatag 9900 aattataaaa gggtttgtaa ataattacaa cagatggcct actttaagaa atgctattgt 9960 tttaccctta agatggttaa cttactataa actaaacact tatccttctt tgttggaact 10020 tacagaaaga gatttgattg tgttatcagg actacgtttc tatcgtgagt ttcggttgcc 10080 taaaaaagtg gatcttgaaa tgattataaa tgataaagct atatcacctc ctaaaaattt 10140 gatatggact agtttcccta gaaattacat gccatcacac atacaaaact atatagaaca 10200 tgaaaaatta aaattttccg agagtgataa atcaagaaga qtattaqaqt attatttaaq 10260 agataacaaa ttcaatgaat gtgatttata caactgtgta qttaatcaaa gttatctcaa 10320

caaccctaat catgtggtat cattgacagg caaagaaaga gaactcagtg taggtagaat 10380 gtttgcaatg caaccgggaa tgttcagaca ggttcaaata ttggcagaga aaatgatagc 10440 tgaaaacatt ttacaattct ttcctgaaag tcttacaaga tatggtgatc tagaactaca 10500 aaaaatatta gaattgaaag caggaataag taacaaatca aatcgctaca atgataatta 10560 caacaattac attagtaagt gctctatcat cacagatctc agcaaattca atcaagcatt 10620 t Cgatatgaa acgtcatgta tttgtagtga tgtgctggat gaactgcatg gtgtacaatc 10680 totattttcc tggttacatt taactattcc tcatgtcaca ataatatqca catataqqca 10740 tgcaccccc tatataggag atcatattgt agatettaac aatgtagatg aacaaagtgg 10800 attatataga tatcacatgg gtggcatcga agggtggtgt caaaaactgt ggaccataga 10860 agctatatca ctattggatc taatatctct caaagggaaa ttctcaatta ctgctttaat 10920 taatggtgac aatcaatcaa tagatataag caaaccaatc agactcatgg aaggtcaaac 10980 tcatgctcaa gcagattatt tgctagcatt aaatagcctt aaattactgt ataaaqagta 11040 tgcaggcata ggccacaaat taaaaggaac tgagacttat atatcacgag atatgcaatt 11100 tatgagtaaa acaattcaac ataacggtgt atattaccca gctagtataa agaaagtcct 11160 aagagtggga ccgtggataa acactatact tgatgatttc aaagtgagtc tagaatctat 11220 aggtagtttg acacaagaat tagaatatag aggtgaaagt ctattatgca gtttaatatt 11280 tagaaatgta tggttatata atcagattgc tctacaatta aaaaatcatg cattatgtaa 11340 caataaacta tatttggaca tattaaaggt tctgaaacac ttaaaaacct tttttaatct 11400 tgataatatt gatacagcat taacattgta tatgaattta cccatgttat ttggtggtgg 11460 tgateccaae ttgttatate gaagttteta tagaagaaet cetgaettee teacagagge 11520 tatagttcac tctgtgttca tacttagtta ttatacaaac catgacttaa aagataaact 11580 tCaagatctg tcagatgata gattgaataa gttcttaaca tgcataatca cgtttgacaa 11640 aaaccctaat gctgaattcg taacattgat gagagatcct caagctttag ggtctgagag 11700 aCaagctaaa attactagcg aaatcaatag actggcagtt acagaggttt tgagtacagc 11760 tCcaaacaaa atattctcca aaagtgcaca acattatact actacagaga tagatctaaa 11820 tgatattatg caaaatatag aacctacata tcctcatggg ctaagagttg tttatgaaag 11880 tttacccttt tataaagcag agaaaatagt aaatcttata tcaggtacaa aatctataac 11940 taacatactg gaaaaaactt ctgccataga cttaacagat attgatagag ccactgagat 12000 gatgaggaaa aacataactt tgcttataag gatacttcca ttggattgta acagagataa 12060 aagagagata ttgagtatgg aaaacctaag tattactgaa ttaagcaaat atgttaggga 12120

aagatettgg tetttateea atatagttgg tgttacatea eecagtatea tgtatacaat 12180 ggacatcaaa tatactacaa gcactatatc tagtggcata attatagaga aatataatgt 12240 taacagttta acacgtggtg agagaggacc cactaaacca tgggttggtt catctacaca 12300 agagaaaaaa acaatgccag tttataatag acaagtctta accaaaaaac agagagatca 12360 aatagateta ttagcaaaat tggattgggt gtatgcatet atagataaca aggatgaatt 12420 catggaagaa ctcagcatag gaacccttgg gttaacatat gaaaaggcca agaaattatt 12480 tccacaatat ttaagtgtca attatttgca tcgccttaca gtcagtagta gaccatgtga 12540 attocctgca toaataccag ottatagaac aacaaattat cactttgaca otagooctat 12600 taatcgcata ttaacagaaa agtatggtga tgaagatatt gacatagtat tccaaaactg 12660 tataagcttt ggccttagtt taatgtcagt agtagaacaa tttactaatg tatgtcctaa 12720 cagaattatt ctcataccta agettaatga gatacatttg atgaaacctc ccatattcac 12780 aggtgatgtt gatattcaca agttaaaaca agtgatacaa aaacagcata tgtttttacc 12840 agacaaaata agtttgactc aatatgtgga attattctta agtaataaaa cactcaaatc 12900 tggatctcat gttaattcta atttaatatt ggcacataaa atatctgact attttcataa 12960 tacttacatt ttaagtacta atttagctgg acattggatt ctgattatac aacttatgaa 13020 agattctaaa ggtatttttg aaaaagattg gggagaggga tatataactg atcatatgtt 13080 tattaatttg aaagttttct tcaatgctta taagacctat ctcttgtgtt ttcataaagg 13140 ttatggcaaa gcaaagctgg agtgtgatat gaacacttca gatcttctat gtgtattgga 13200 attaatagac agtagttatt ggaagtctat gtctaaggta tttttagaac aaaaagttat 13260 caaatacatt cttagccaag atgcaagttt acatagagta aaaggatgtc atagcttcaa 13320 attatggttt cttaaacgtc ttaatgtagc agaattcaca gtttgccctt gggttgttaa 13380 catagattat catccaacac atatgaaagc aatattaact tatatagatc ttgttagaat 13440 gggattgata aatatagata gaatacacat taaaaataaa cacaaattca atgatgaatt 13500 ttatacttct aatctcttct acattaatta taacttctca gataatactc atctattaac 13560 taaacatata aggattgcta attctgaatt agaaaataat tacaacaaat tatatcatcc 13620 tacaccagaa accctagaga atatactagc caatccgatt aaaagtaatg acaaaaagac 13680 actgaatgac tattgtatag gtaaaaatgt tgactcaata atgttaccat tgttatctaa 13740 taagaagett attaaategt etgeaatgat tagaaceaat tacageaaac aagatttgta 13800 taatttattc cctatggttg tgattgatag aattatagat cattcaggca atacagccaa 13860

atccaaccaa	ctttacacta	ctacttccca	ccaaatatct	ttagtgcaca	atagcacatc	13920
actttactgc	atgcttcctt	ggcatcatat	taatagattc	aattttgtat	ttagttctac	13980
aggttgtaaa	attagtatag	agtatatttt	aaaagatctt	aaaattaaag	atcccaattg	14040
tatagcattc	ataggtgaag	gagcagggaa	tttattattg	cgtacagtag	tggaacttca	14100
tcctgacata	agatatattt	acagaagtct	gaaagattgc	aatgatcata	gtttacctat	14160
tgagttttta	aggctgtaca	atggacatat	caacattgat	tatggtgaaa	atttgaccat	14220
tcctgctaca	gatgcaacca	acaacattca	ttggtcttat	ttacatataa	agtttgctga	14280
acctatcagt	ctttttgtct	gtgatgccga	attgtctgta	acagtcaact	ggagtaaaat	14340
tataatagaa	tggagcaagc	atgtaagaaa	gtgcaagtac	tgttcctcag	ttaataaatg	14400
tatgttaata	gtaaaatatc	atgcţcaaga	tgatattgat	ttcaaattag	acaatataac	14460
tatattaaaa	acttatgtat	gcttaggcag	taagttaaag	ggatcggagg	tttacttagt	14520
ccttacaata	ggtcctgcga	atatattccc	agtatttaat	gtagtacaaa	atgctaaatt	14580
gatactatca	agaaccaaaa	atttcatcat	gcctaagaaa	gctgataaag	agtctattga	14640
tgcaaatatt	aaaagtttga	taccctttct	ttgttaccct	ataacaaaaa	aaggaattaa	14700
tactgcattg	tcaaaactaa	agagtgttgt	tagtggagat	atactatcat	attctatagc	14760
tggacgtaat	gaagttttca	gcaataaact	tataaatcat	aagcatatga	acatcttaaa	14820
atggttcaat	catgttttaa	atttcagatc	aacagaacta	aactataacc	atttatatat	14880
ggtagaatct	acatatcctt	acctaagtga	attgttaaac	agcttgacaa	ccaatgaact	14940
taaaaaactg	attaaaatca	caggtagtct	gttatacaac	tttcataatg	aataatgaat	15000
aaagatctta	taataaaaat	tcccatagct	atacactaac	actgtattca	attatagtta	15060
ttaaaaatta	aaaatcatat	aatttttaa	ataactttta	gtgaactaat	cctaaagtta	15120
tcattttaat	cttggaggaa	taaatttaaa	ccctaatcta	attggtttat	atgtgtatta	15180
actaaattac	gagatattag	tttttgacac	ttttttctc	gt		15222

<210> 15

acgcgaaaaa atgcgtataa caaacctgta catccaaaaa agatcggggc aaataaaacc 60
ttgaaaggga gttttcccct ctcttcttc tacagaaaat gggcagtgaa acattgagtg 120
taattcaagt cagattaagg aatatatatg ataatgataa agtagcattg cttaaaataa 180

<211> 15140

<212> DNA

<213> Bovine respiratory syncytial virus

<400> 15

13

PCT/US2004/040727

catgtcatac caatagatta atacttctaa ctcacacatt ggccaaatca gtcatacata 240 caattaaatt aagtggtata gtattcatac atattataac cagtagtgat tactgtccta 300 catctgatat tatcaatagt gccaatttca cttcaatgcc tatattacaa aatggaggat 360 atatatggga attgatggag ttaacacatt gtttccaaac aaacggttta atagatgata 420 attgtgaaat aacattttct aaaaggttaa gtgattcaga attagctaaa tattcaaatc 480 aattatetae tettettggt etgaattaga geeetaaate aatageeaae accagatgga 540 ctaagctaac taaatgtaat agtttataaa aattaattgg ggcaaataaa tcagttcccc 600 aaccagccat gagcacccca aatcccgaaa ccactgctca gagattgata gtaaatgata 660 tgaggccatt atcaatagaa acagaaataa tatctttgac caaagatatt attacacata 720 cattcatata tctaataaac catgagtgta tagtacgcaa actcgatgaa cgacaggcca 780 catttacatt ccttgtcaat tatgaaatga agctattgca taaagtgggt agcacaaaat 840 acaataaata cacagaatac aacagaaaat atggtacatt tccaatgcct atatttatca 900. accatgatgg ttttttagag tgtataggta tcaagcctac aagaaatact cctataatat 960 ataagtatga tttaaatcca taggcacttt tcaaaattta attcacacag tgttatcttt 1020 tggtaccaat gtcaaccaaa ttcccacata gtgcatagta gtaattaaaa aagaaccaqq 1080 ttagaaacaa aaaaaggtag agaataacaa caaacaaaaa tqaaatqtqq qqcaaataca 1140 aaaatggctc ttagcaaggt caaactaaat gacactttca acaaggatca actgttgtca 1200 accagcaaat atactattca acgtagtaca ggtgacaaca ttgatatacc caattacgat 1260 gtgcaaaaac atctcaataa gttgtgtggt atgctattaa taacagaaga tgccaatcat 1320 aaatttacag gactgatagg tatgttatat gctatgtccc gattggggag agaagatacc 1380 cttaaaatac tcaaagatgc aggctaccaa gtgagggcca atggggttga tgtgataaca 1440 catcgacagg atgtgaatgg aaaagaaatg aaatttgaag tgctaacatt agtcagctta 1500 acatcagaag ttcaaggtaa tatagaaata gagtcaagga agtcttacaa aaagatgcta 1560 aaagagatgg gagaggtagc tccagaatac agacatgact ctcctgattg tggtatgata 1620 gtgctatgtg ttgctgcttt ggttataaca aaattagcag caggtgatag gtcaggcctc 1680 actgcagtca ttaggagagc caacaatgta ctaaggaatg aaatgaaacg atacaaagga 1740 ctcatcccga aagatatagc caacagcttc tatgaagtat ttgaaaagta ccctcattac 1800 atagatgtat tegtacattt tggcattget caateeteaa etagaggagg tagtagggta 1860 gaaggaatct ttgcagggtt attcatgaat gcatatggag caggtcaagt gatgttaaga 1920 tggggtgtac tagccaaatc agtcaagaat attatgcttg gtcatgccag cgtacaagca 1980

gaaatggaac	: aggttgtaga	agtctatgaa	. tatgcacaaa	agttaggtgg	agaagctggt	2040
ttttatcaca	tactgaacaa	. ccctaaagca	tcattgttat	ccttaacaca	attccccaat	2100
ttctctagtg	tagtcctagg	caatgctgca	ggactaggta	taatgggtga	gtatagaggt	2160
acaccaagaa	accaagactt	gtatgatgct	gccaaagcat	atgcagaaca	actaaaagag	2220
aatggggtca	tcaattacag	tgtattggat	ctgactacag	aggaattaga	ggcaatcaag	2280
aaccaattga	atcccaaaga	taatgatgtg	gaattgtgag	ttaataaaaa	catggggcaa	2340
atacgtcagt	atggaaaaat	ttgcacctga	gtttcatgga	gaagatgcca	atacaaaagc	2400
aaccaagttt	cttgaatccc	taaaagggaa	atttacttct	tctaaggatt	ctaggaaaaa	2460
agatagtata	atatcagtta	attccgtaga	catagaatta	cctaaagaga	gtcctataac	2520
atctaccaat	caaaatatca	accaaccaag	tgagatcaat	gacactattg	ctacaaatca	2580
agttcatata	agaaagcctt	tggtaagctt	caaagaagaa	ctgccatcaa	gtgaaaaccc	2640
ctttacaagg	ctgtataagg	aaactataga	aacatttgac	aataatgaag	aagaatcaag	2700
ctactcatat	gatgagataa	atgatcaaac	aaatgataat	ataacagcaa	gactagatag	2760
gatagatgaa	aaattaagcg	agataatagg	aatgctccat	acattagttg	tggctagtgc	2820
aggaccaaca	gctgctcgtg	acggtataag	agatgccatg	gtagggctcc	gagaagagat	2880
gattgagaaa	ataagatcag	aagctttaat	gaccaacgat	aggttagaag	caatggccag	2940
gcttagggat	gaagaaagtg	aaaagatgac	aaaagataca	tcagatgaag	taaaattaac	3000
ccctacctca	gagaagctga	acatggtatt	agaagatgaa	agtagtgaca	atgatctatc	3060
acttgaagat	ttctgaatag	caaccagccc	acccactaac	agattagtca	gatagatcaa	3120
ccatcaatga	taaagccacc	taatcaacca	gccaaccagt	cactcaacca	gcctgtgatt	3180
ccacatagtt	agtaaaaata	aagtaaaatt	ggggcaaata	tggagacata	cgtgaacaaa	3240
ctccatgaag	gatcaactta	cacagctgct	gttcagtaca	atgtcataga	aaaagatgat	3300
gatcctgcat	ctctcacaat	atgggttcct	atgttccaat	catccatctc	tgctgatttg	3360
cttataaaag	aactaatcaa	tgtgaacata	ttagttcgac	aaatttctac	tctgaaaggt	3420
ccttcattga	agattatgat	aaactcaaga	agtgctgtac	tagcccaaat	gcccagcaaa	3480
tttaccataa	gtgcaaatgt	atcattggat	gaacgaagca	aattagcata	tgacataact	3540
actccttgtg	aaattaaggc	ttgtagttta	acatgtttaa	aggtgaaaaa	tatgctcaca	3600
actgtgaaag	atctcaccat	gaaaacattc	aatcctaccc	atgagatcat	tgcactgtgt	3660
gaatttgaaa	atatcatgac	atccaaaaga	gttgttatac	caactttctt	aaggtcaatc	3720

15

aatgtaaaag caaaggattt ggactcacta gagaatatag ctaccacaga gttcaaaaat 3780 gccatcacta atgctaaaat tataccttat gctgggttgg tattagttat cactgtaact 3840 gacaataaag gggcattcaa gtacattaaa ccacaaagtc aatttatagt agatcttggt 3900 gcatatctag agaaagagag catatattat gtaactacaa attggaaaca cacggccact 3960 aaatteteea ttaageetat agaggaetga tteteacaca aettatetta acacaacaga 4020 agactccctt aataacttac taatcatcat tgtaatcgaa tcttatttgc tgctctatca 4080 accataatca tcatattttc tcaacctgat taacccttca attcatcttg tagattatac 4140 ctcagttaga taaataaaaa ttatgaatgc caacaaagat tatgtggggc aaataaaatc 4200 tgcatccaat caagtacagc atacaccaga aactcctcga atccaccagc tggttgaact 4260 tattacaatg aacaatacat ctaccataat agagtttact ggtgaatttt ggacttactt 4320 tacattagcc tttatgatgt taaccatagg ttttttcttt attgtcacat cattagtggc 4380 agcaatactg aacaaattat gtgacttcaa cgatcatcat acaaatagtc tagacatcag 4440 aactaggett agaaatgata cacaattgat aacaagagea catgaaggat ccatcaacca 4500 atcaagcaac taagaggaca acaaaacaaa agaaaatagc aacatgcatc aaagttaagc 4560 aaaggaaaac cacaaagaat cagacaatca tcactcatat ctttttagtc tacaaatqct 4620 gcattatgta ctgttaatta gttatttaaa attaaactta aaaatggttt atggttacat 4680 acagatgttg gggcaaatac aagtatgtcc aaccataccc accatcttaa attcaagaca 4740 ttaaagaggg cttggaaagc ctcaaaatac ttcatagtag gattatcatg tttatataag 4800 ttcaatttaa aatcccttgt ccaaacggct ttgaccacct tagcaatgat aaccttgaca 4860 tcactcgtca taacagccat tatttacatt agtgtgggaa atgctaaagc caagcccaca 4920 tccaaaccaa ccatccaaca aacacaacag ccccaaaacc atacctcacc atttttcaca 4980 gagcacaact acaaatcaac tcacacatca attcaaagca ccacactgtc ccaactacca 5040 aacacagaca ccactagaga aactacatac agtcactcaa tcaacgaaac ccaaaacaga 5100 aaaatcaaaa gccaatccac tctacccgcc accagaaaac caccaattaa cccatcggga 5160 agcaaccccc ctgaaaacca ccaagaccac aacaactccc aaacactccc ctatgtgcct 5220 tgcagtacat gtgaaggtaa tcttgcttgt ttatcactct gccaaatcgg gccggagaga 5280 gcaccaagca gagccctac aatcaccctc aaaaagactc caaaacccaa aaccaccaaa 5340 aagccaacca agacaacaat ccaccacaga accagccctg aagccaaact gcaacccaaa 5400 aacaacacgg cagctccaca acaaggcatc ctctcttcac cagaacacca cacaaatcaa 5460 tcaactacac agatctaaca acacacctcc atataatatc aattatgttc atatatagtt 5520

atttaaaaag	atatgtataa	ttcactaatt	aaaactgggg	caaataagga	tggcgacaac	5580
agccatgagg	atgatcatca	gcattatctt	catctctacc	tatgtgacac	atatcacttt	5640
atgccaaaac	ataacagaag	aattttatca	atcaacatgc	agtgcagtta	gtagaggtta	5700
ccttagtgca	ttaagaactg	gatggtatac	aagtgtggta	acaatagagt	tgagcaaaat	5760
acaaaaaat	gtgtgtaaaa	gtactgattc	aaaagtgaaa	ttaataaagc	aagaactaga	5820
aagatacaac	aatgcagtag	tggaattgca	gtcacttatg	caaaatgaac	cggcctcctt	5880
cagtagagca	aaaagaggga	taccagagtt	gatacattat	acaagaaact	ctacaaaaaa	5940
gttttatggg	ctaatgggca	agaagagaaa	aaggagattt	ttaggattct	tgctaggtat	6000
tggatctgct	gttgcaagtg	gtgtagcagt	gtccaaagta	ctacacctgg	agggagaggt	6060
gaataaaatt	aaaaatgcac	tgctatccac	aaataaagca	gtagttagtc	tatccaatgg	6120
agttagtgtc	cttactagca	aagtacttga	tctaaagaac	tatatagaca	aagagcttct	6180
acctcaagtt	aacaatcatg	attgtaggat	atccaacata	gaaactgtga	tagaattcca	6240
acaaaaaaac	aatagattgt	tagaaattgc	tagggaattt	agtgtaaatg	ctggtattac	6300
cacacctctc	agtacataca	tgttgaccaa	tagtgaatta	ctatcactaa	ttaatgatat	6360
gcctataacg	aatgaccaaa	aaaagctaat	gtcaagtaat	gttcaaatag	tcaggcaaca	6420
gagttattcc	attatgtcag	tggtcaaaga	agaagtcata	gcttatgttg	tacaattgcc	6480
tatttatgga	gttatagaca	cccctgttg	gaaactacac	acctctccgt	tatgcaccac	6540
tgataataaa	gaagggtcaa	acatctgctt	aactaggaca	gatcgtgggt	ggtattgtga	6600
caatgcaggc	tctgtgtctt	ttttcccaca	gacagagaca	tgtaaggtac	aatcaaatag	6660
agtgttctgt	gacacaatga	acagtttaac	tctgcctact	gacgttaact	tatgcaacac	6720
tgacatattc	aatacaaagt	atgactgtaa	aataatgaca	tctaaaactg	acataagtag	6780
ctctgtgata	acttcaattg	gagctattgt	atcatgctat	gggaagacaa	aatgtacagc	6840
ttctaataaa	aatcgtggaa	tcataaagac	tttttccaat	gggtgtgatt	atgtatcaaa	6900
caaaggagta	gatactgtat	ctgttggtaa	cacactatat	tatgtaaata	agctagaggg	6960
gaaagcactc	tatataaagg	gtgaaccaat	tattaattac	tatgatccac	tagtgtttcc	7020
ttctgatgag	tttgatgcat	caattgccca	agtaaacgca	aaaataaacc	aaagcctggc	7080
cttcatacgt	cgatctgatg	agttacttca	cagtgtagat	gtaggaaaat	ccaccacaaa	7140
tgtagtaatt	actactatta	tcatagtgat	agttgtagtg	atattaatgt	taatagctgt	7200
aggattactg	ttttactgta	agaccaagag	tactcctatc	atgttaggga	aggatcagct	7260

17

cagtggtatc aacaatcttt cctttagtaa atgaaatgca taatgtttac aatctaaacc 7320 tcagaatcat aaatgtgatg agctaaattt actaatacat tcaaaagttc tatccgccaa 7380 gacctgcatt tttatcaggt cttacataag ctaaccttac atgctacact caactccatg 7440 ttgatagtta tataaaaata ttatattagt ctcaaagaat aaaattattt aacaaccaat 7500 cattcaaaaa gatggggcaa atatgtcacg aagaaatccc tgcaaatatg agattagggg 7560 acattgctta aatggtaaaa aatgtcattt tagtcataat tactttgaat ggcctccaca 7620 tgctttatta gtgaggcaaa attttatgct aaataagata ttaaaatcta tggacaggaa 7680 caacgatacc ctgtcagaaa taagtggtgc agcagagttg gatagaacag aagaatatgc 7740 attgggtgta ataggagttt tggaaagtta cctaggctct atcaataata taacaaaaca 7800 atcagcctgt gttgctatga gtaaactatt agccgagatt aacaatgatg acataaagag 7860 7920 atatattgat agcaacaaga gaaacacaaa acaaactata catttgctta agagattgcc 7980 tgcagacgta cttaaaaaga caatcaagaa cactatagat attcacaacg aaataaatgg 8040 taataaccaa ggtgacataa ttgttaatga acaaaatgaa taactccaac attattattt 8100 tcccagaaaa atacccttgt agcatatcct ctttgctaat taagaatgaa aatgatgtta 8160 ttgtactaag tcatcaaaat gttcttgact acttacagtt tcaatatcca tgtaatatgt 8220 attctcaaaa tcatatgctt gatgatatct attggacatc acaggagcta attgaggatg 8280 tacttaagat tetteatett tetggeatat eeataagtaa gtatgtgata tatgttttag 8340 tgctatagta tataagtcac tcaactatta atcaacagcc acttcttcat agctagcaat 8400 atataaggac aaaatggata cactcattca tgagaactca actaatgttt acttaacaga 8460 tagttattta aaaggtgtca tctctttttc tgagtgcaat gccctgggaa gctacttgtt 8520 ggatggacct tatctaaaaa atgattatac caacatcata agtagacaga aaccattgat 8580 agaacatata aacttaaaaa aattgtctat catacagtct tttgtaacta agtataacaa 8640 aggagagctg ggtttagaag aacccactta ctttcaatct ttacttatga cttacaaaag 8700 tetgtetaca teagaattaa teacaactae aactetgttt aaaaagataa ttegtagage 8760 tatagaaata agtgatgtca aagtatatgc tatattgaac aaattgggtt taaaagaaaa 8820 gggaaaagtt gatagatgtg atgacactaa cacaacgcta tctaacatag taagagataa 8880 tatactctca gtcataagtg acaatactcc cagtactaaa aaaccaaata attcatcgtg 8940 taaaccagat cagccaatta aaacaacaat tttatgcaag cttttaagtt cgatgagtca 9000 tccccctaca tggttaatac attggtttaa tttatacaca aaattaaatg acatcttgac 9060

ccaatacaga acaaatgaag caagaaatca tggttacata cttatagata ctagaacctt 9120 gggtgaattc caatttatat taaatcaata tggttgcatt gtatatcata agaaattaaa 9180 gaaaattaca atcaccacat ataatcaatt tctaacatgg aaagacatta gcctcagtag 9240 attaaatgtt tgtatgatca cctggataag caattgttta aataccttga ataaaagcct 9300 tggattgaga tgtgagttta acaatgtcac tctatctcaa ttattccttc atggggattg 9360 tatattgaaa ttatttcata atgaaggtta ctatattata aaagaagttg aaggttttat 9420 aatgtcatta attttgaacc taacggaaga agatcaattc agaaaaagat tcttcaacag 9480 tatgctaaat aatattacag atgctgcagc aagagctcaa caagatttat tatcaagagc 9540 ccgccatact atattagaca aaacaatatc agataacata ttaaatggta aatggttaat 9600 tttattaggt aagtttctta aattgattaa attagctggt gctaataatc ttaataacct 9660 aagtgaactc tactttetet ttagaatatt tggacateee atggtagatg aacggcaage 9720 aatggatgct gtgagattaa actgtaatga aactaaattt tacttattga gtagccttag 9780 catgttaaga ggtgcattca tttatagaat tataaaggga tttgtaaaca catataatag 9840 gtggcctacc ttaaggaatg ctatagtttt acccttaaga tggataaatt actacaaact 9900 caatacttac ccatcattat tagaattaac agaagctgat ttgattatat tgtctggact 9960 gagattttat agagaattcc atctaccgaa aaaagtagat ttagaagtca taataaatga 10020 taaagcaata tcacctccca aaaaccttat ctggaccagt tttcccaaaa actatatgcc 10080 atcacacata cagatttaca tagaacatga aagactaaag tttactgaga gtgatagatc 10140 tagaagggtt ctggaatatt atttaaggaa taatagattc agtgagagtg acctatataa 10200 ctgtatagta aaccaggaat atcttaataa tccaaaccat gtaatatcat taacaggaaa 10260 agaaagagaa cttagtgtag gtaggatgtt tgcaatgcag ccaggcatgt tcagacaggt 10320 tcaaatcatg gctgagaaat tgatagctga gaacatctta caatttttcc ctgagagttt 10380 aacacggtat ggagatcttg aattacagaa aatattagaa ttaaaagcag gcattagcaa 10440 caaagcaaat cgctgtaatg ataactataa caattatatc agtaaatgtt ctataatcac 10500 tgatcttagc aagttcaatc aggcattcag gtatgaaacg tcatgcattt gtagcgatgt 10560 tttagatgaa ttacatggtg tacaatctct cttttcttgg ttgcatttaa ctattccttt 10620 tgccactgtt atatgtactt atagacatgc tccaccttac ataagaaatc atataacaqa 10680 tcttaataag gttgatgagc aaagtggact gtatagatat catatgggtg gtatagaagg 10740 ttggtgtcaa aaattgtgga ctattgaagc gatatcttta ttagatttaa tatctatcaa 10800

19

ggggaaattt tcaatcacag ctttaatcaa tggtgataat caatcaattg atataagtaa 10860 gcctatcaaa ttaaatgaag gacaaactca tgcacaggct gattatctat tagcacttaa 10920 aagcettaag ttgttgtata aagaatatge tagtataggt cataaaetta aaggtaegga 10980 gacatatata tcccgtgata tgcaatttat gagtaaaacc attcagcata atggtgtata 11040 ctatcctgca agcatcaaaa aagtgctacg agtaggtcca tggataaaca caatactgga 11100 tgattttaaa gtaagtatgg agtctatagg tagtttgact caagagttag aatatagagg 11160 agaaagttta ctatgcagtt tgatttttag gaatgtctgg ttgtataatc aaattqcttt 11220 gcaacttaag aatcatgcat tatgtcacaa caaactgtat ctagatatct tgaaagtgtt 11280 agcacactta aaaatgtttt ttaaccttga taatatagat actgccctaa cactatatat 11340 gaatttgcca atgttatttg gtggtggaga cccaaattta ttatatcgga gtttctatag 11400 aagaactccg gattttctta cagaagctat agcacattct gtctttgtgc ttagttatta 11460 tacaggacat gatcttcaag ataaattaca agatttacca gatgataaat taaataagtt 11520 tcttacatgt atcataactt ttgataagaa ccctaatgca gaatttgtaa cattgatgag 11580 agatccacaa gctttagggt ctgagagaca agctaaagtc actagtgaaa ttaatagatt 11640 11700 ttacactact actgaagttg atttaaatga tgtaatgcaa aaaatagagc cgacttaccc 11760 gcatggatta agagtggtct atgaaagtct tcctttctac aaagcagaaa aaattgttaa 11820 tttaatatca ggcactaaat ctatcaccaa tatacttgaa aaaacatctg ctattgatta 11880 tacagacatt gagagagcta tagatatgat gagaaagaat ataactttgc taattagaat 11940 tcttccatta gattacaata aagccaagtt gggattgtta agtctcaaca atcttagtat 12000 cactgatata agtaaatatg taagagaaag atcttggtca ctgtctaaca ttgtaggtat 12060 tacatctcct agcatattat atacaatgga tattaaatac accactagca ctataactag 12120 tggtataata attgaaaaat acaattccaa ttttttgact cgtggtgaga ggggtcccac 12180 taaaccatgg gtaggatcat caacccaaga aaagaaaaca atgcctgtat acaataggca 12240 ggttttaact aagaaacaaa aggatcaaat tgatttgttg gcaaaactag attgggttta 12300 tgcctctata gataacaaag atgagtttat ggaagtatta tgtttgggaa cacttggact 12360 atcctatgaa aaagccaaga aattgttccc tcaatacctg agtgtaaact acctgcatcg 12420 tcttacagtt agtagtagac catgtgagtt tccagcctca ataccagctt acagaacaac 12480 taattaccac tttgacacaa gtccaattaa tcgaatacta actgaaaaat atggtgatga 12540 agacattgat atagtgtttc agaattgtat cagttttggt cttagcttaa tgtcagttgt 12600

agaacaattt acaaatgta	t gcccaaatag	aattattcta	ataccaaaac	ttaatgaaat	12660
tcatttgatg aagccacco	a tatttacagg	tgatgttgac	atttgtaagc	ttaatcaggt	12720
gatacagaaa cagcatatg	t ttttacctga	taaaatcagt	ttgtctcaat	atgttgaatt	12780
gttccttagc aataaaaca	c ttaagaatag	tccacatata	agctctaatt	tagtgttagt	12840
gcacaaaatg tctgattac	t ttttgcataa	gtatgtttta	agcacaaact	tagcaggaca	12900
ttggataatg atcatacag	c ttatgaaaga	ttctaaaggg	atttttgaga	aggattgggg	12960
tgaaggatat ataactgat	c atatgtttt	agatttaaat	gtcttttttg	atgcatataa	13020
aacatatttg ttatgtttt	c ataaaggtta	tggaaaagct	aaattagaat	gtgatatgaa	13080
tacatcagat cttttttgt	a cattagagtt	aatagatatc	agctattgga	aatccatgtc	13140
caaggtgttc ttagaacaa	a aagtagtgaa	gcacataatt	aatcaagatt	ctagtctaca	13200
tagagtaaga gggtgccat	a gttttaagtt	atggttcctt	aagcgtctta	atacatctaa	13260
gttcattgtt tgtccttgg	g tagtcaatat	agattatcat	ccaactcata	tgaaagccat	13320
attgacttac atggagttg	a ctactatggg	gttagtccat	gtagacaaac	tatacacaga	13380
ccaaaaacat aaactaaat	g atggatttta	cacatcaaat	ctattttata	tcaattataa	13440
tttttcagat aatacacac	tgttaactaa	acagataaga	gtagcaaatt	cagagttaat	13500
agataactat aatacattg	atcatccatc	tcctgaatct	ttagaaagta	ttttaaaaaag	13560
gtctaatcaa agtaataat	g taattgaatt	gaaagactat	cccatagata	aattccaatc	13620
tccaaaggga cggggggtc	cagacataac	atgcataagc	tctaaccaaa	aaataaaaca	13680
aggttataac aatcaagat	c tgtacaatct	atttccagca	gtaataatag	acaagattgt	13740
agatcattca ggtaacatt	g caaacatcaa	ccaaatgtat	acaattactc	caaatcaact	13800
tacattaata agtaatggta	a cttcattata	ctgtatgctt	ccgtggcatc	atataaatag	13860
gtttaatttt gtgtttagc	ccactggttg	caaaattagt	acaaaactta	tacttaagga	13920
tcttaaaata aaggatcct	attgtatagc	ctttataggg	gaaggggcag	gaaatttgtt	13980
gttacgcaca gtagtggaat	: tacatccaga	cataaaatat	atttatagaa	gtctaaaaga	14040
ttgtaatgat catagtttad	: caattgagtt	tctaagatta	tacaatggcc	atataagtat	14100
agattatgga gaaaatctaa	ctataccagc	cactgatgca	accaatgcta	tacattggtc	14160
ttacttacat ataagatato	cagaacccat	aaatcttttt	gtatgtgatg	ctgagttacc	14220
tgatttaact aactggagta	gaattgtttc	agaatggtat	aagcatgtta	gatgttgcaa	14280
gtattgctct acaattgaco	gaagtaaatt	aattgtaaaa	tatcatgcac	aagatatcac	14340

tgattcaaa ttaaataaca tatcaatagt caaaacatat gtgtgcttag gtagtaagct 14400 gaaaggttct gaggtttatt tagtccttac agttggtcca tctaatatat ttccatcttt 14460 caatgtagtg cagaatgcta agttgatact ttcaaggaca caaaattttc ccatgctaa 14520 gaaggattgac aaggattcag tagatgcaaa tatcaaaagt ttgataccgt ttctttgtta 14580 tcctataact aagaaaggga taaaggcagc attatctaag ttaaaagatg tggtagatgg 14640 aaacatttta tcatattcta tagcagggcg aaatgaagtt tatagtaaca agcttataaa 14700 ctataaaattg ttaaacatcc taaaatggtt agatcatata ttaaatttc gatctctaga 14760 gttcagctat aatcacttat atatgattga atcaacatat cctttcttaa gtgagttact 14820 aaacagtttg actactaatg aacttaaaaa attaattaag gtaacagga gtgtattata 14880 tagtcttcag catgaattgt aagaccata acactttggt gtgattcatt ttacaaccat 14940 gattatatgt aatcacata tcaactaat tcacattatc tatatgttg 15000 ttaatcttaa attcccacat atctgtgttc caactcaaat tccactggtc aagatctaaa 15060 ccagaaaatc aaaaatttaa tggtacgaga atatgtcctt tatgttgcaa gaggatagtt 15120 tttgatactt tttttctcgt

21

PCT/US2004/040727